



# New records of three species of *Pompilocalus* Roig-Alsina (Hymenoptera: Pompilidae) in Brazil and Chile

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**Abstract:** *Pompilocalus* includes 55 species, which occur in the southern South America and its range extends up to Ecuador along the Andes. This paper presents new records for three species of *Pompilocalus*: *P. guayamallen* Roig-Alsina, *P. parvulus* Roig-Alsina, and *P. tupi* Roig-Alsina. These records represent new limits of the distribution range of those species.

**Key words:** Pepsinae, Pepsini, Chilean Subregion, Andean Region, South America

*Pompilocalus* Roig-Alsina was proposed to include South American species of Pepsinae doubtfully classified as *Chirodamus* Haliday (*sensu* Townes 1957; Evans 1968) and those regarded as *Calopompilus* Ashmead by Banks (1946; Roig-Alsina 1989). Roig-Alsina (1989) diagnosed *Pompilocalus* based on the truncate genicular lobe of the hind femora, the hind tarsomere with ventral spines irregularly arranged, and the rounded glossa.

Species of *Pompilocalus* show slight color variation and are distinguished mainly by proportion of morphometric measurements (Roig-Alsina 1989). Species of the genus have been found in the southern South America extending to Ecuador along the Andes. Some species, such as *P. guayamallen* Roig-Alsina, are known only from the type locality, while other species are widespread in the Chilean Subregion proposed by Wallace (1876). Herein, we present new records for three species of *Pompilocalus*: *P. guayamallen*, *P. parvulus* Roig-Alsina and *P. tupi* Roig-Alsina.

The species' identifications were done based on the Roig-Alsina's (1989) keys and on specimens deposited at the Natural History Museum, London, UK (BMNH) that were determined by the Dr. Roig-Alsina.

Morphological body measurements were taken using a stereomicroscope with a micrometer rule. Abbreviations for the morphometric measurements used in the species diagnosis are the same as those adopted by Roig-Alsina (1989); they are as follow: LID = lower interocular distance; L2C = length of the second cubital cells' upper section; OOL = ocello-ocular line; POL = postocellar line; SL = stigma length; UID = upper interocular distance. To illustrate the three species, photographs were taken of the head in frontal view and the lateral habitus. *Pompilocalus parvulus* was photographed using the software Leica Application Suite (LAS) Version 3.8, and the software Auto Montage Pro Version 5.03.0061, while photos of *P. guayamallen* and *P. tupi* were processed by the software Helicon Focus.

All new records were plotted on a distribution map for the three species using Q-GIS software (Nanni et al. 2002). The specimens included in the present study are deposited at the Entomological Collection of the Escola Superior de Agricultura "Luiz de Queiroz" (ESALQ, curator: Dr. Sinval Silveira Neto), at the Hymenoptera Collection of the Instituto de Biociências, Letras e Ciências Exatas, Universidade Estadual Paulista "Júlio de Mesquita Filho" (IBILCE/UNESP, curator: Dr. Fernando Barbosa Noll), and at the Natural History Museum, London, UK (BMNH, curator: Dr. Gavin Broad).

## ***Pompilocalus guayamallen* Roig-Alsina, 1989**

DIAGNOSIS (FEMALE): Body length 12–18 (14.2) mm; forewing 10.5–17 (12.6) mm; body densely covered by iridescent green-blue pubescence; orangish antennae, with pedicel slightly darker basally; clypeus 2.66× (2.64×) as wide as high; malar space 0.1× as high as the basal mandibular width; UID:LID = 0.88; POL:OOL = 0.71 (0.72); SL:L2C = 1.13–1.20 (1.13); second intercubital



vein straight.

DISTRIBUTION: Argentina (MZA) and Chile (VLP).

MATERIAL EXAMINED: 1♀, Crawford Exp. Valparaíso, 800 ft. S. Coleman, 1903-253 [BMNH].

***Pompilocalus parvulus*** (Banks, 1946)

DIAGNOSIS (FEMALE): body length: 8–13 (11–13) mm; forewing: 8–12 (9–12) mm; antennae entirely orangish or with black stained scape; foretibia with short and strong apical spines; clypeus  $2.62 \times - 3.0 \times (3.0 \times)$  as wide as high; malar space  $0.1 \times$  as high as the basal mandibular width; UID:LID =  $0.86 - 0.98$  mm; POL:OOL =  $1.0 - 1.36$  mm; SL:L2C =  $0.57 - 0.72$  mm.

DISTRIBUTION: Argentina (B.A, CAT, CBA, JUJ, MIS, MZA, SLU, TUC); Brazil (PR, SP)

MATERIAL EXAMINED: 1♀, BRASIL: SP, Anhembi,  $22^{\circ}43'06.4''$  S,  $048^{\circ}10'29.2''$  W, 455 m, 05.vii.2012, E.N.L. Ferreira col [IBILCE/UNESP]; 1♀, [same locality], 14.viii.2012 E.N.L. Ferreira col. [ESALQ]; 1♀, BRASIL: SP, Anhembi,  $22^{\circ}42'39.9''$  S,  $048^{\circ}10'06.6''$  W, 461 m, 05.vii.2012, E.N.L. Ferreira col [ESALQ].

***Pompilocalus tupi*** Roig-Alsina, 1989

DIAGNOSIS (FEMALE): body length: 13.7 mm; forewing: 11.51 mm; body black with metasoma weakly covered by iridescent blue pubescence; scape and pedicel darker and orangish flagellum; clypeus  $2.69 \times - 3 \times (3.04 \times)$  as wide as high; malar space  $0.13 \times$  as high as the basal mandibular width; UID:LID: 0.84; POL:OOL:  $0.59 - 0.73 (0.67)$ ; SL:L2C:  $1.20 - 1.51 (1.27)$ ; second intercubital vein slightly arched.

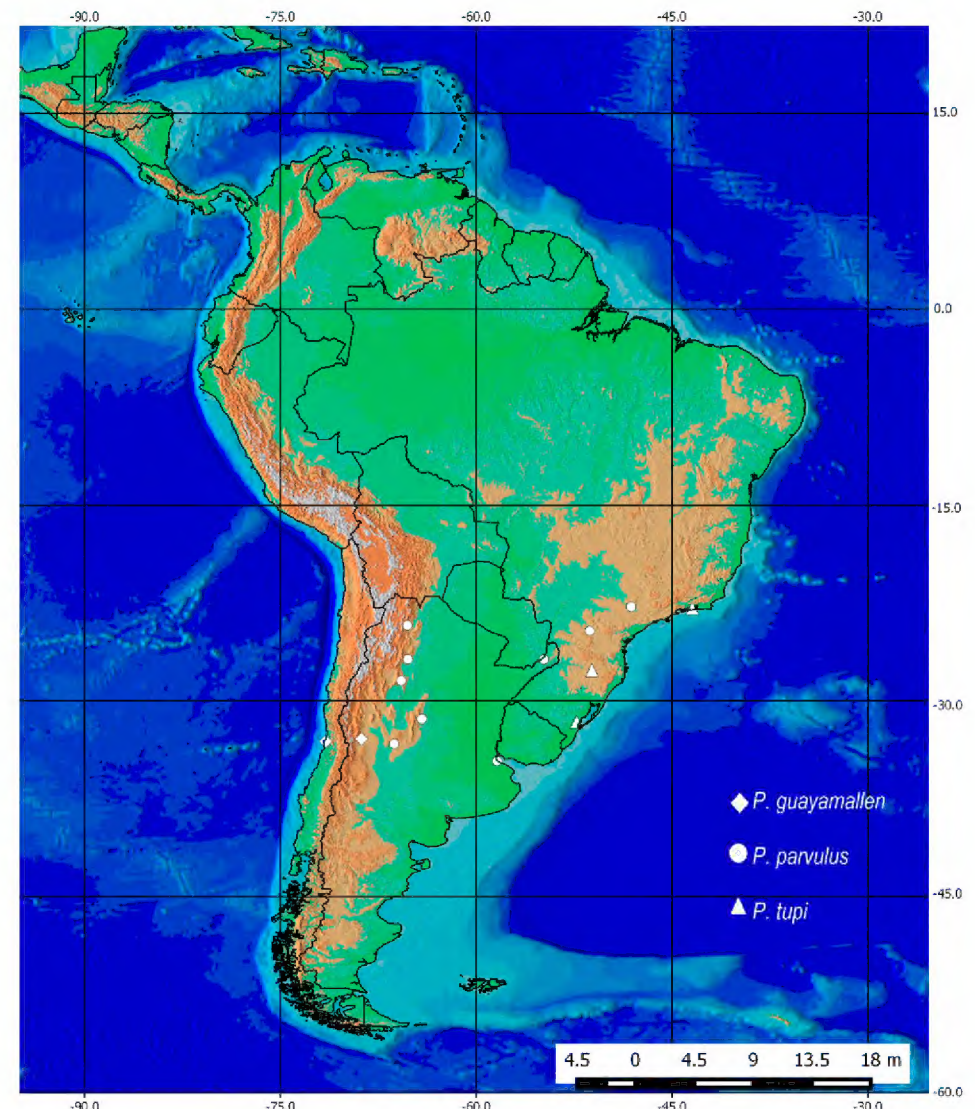
DISTRIBUTION: Brazil (RJ, RS, SC).

MATERIAL EXAMINED: 1♀, Brazil: RS, PELOTAS, 9.III.1960, C.M. Biezanko, B.M. 1961-721 [BMNH]

*Pompilocalus guayamallen* has been recorded only from the type locality in Mendoza, Argentina. Herein, we record one female from Valparaíso, Chile (Figure 1). The specimen shows no morphological variation from Roig-Alsina's (1989) description (Figure 2). The new record indicates that *P. guayamallen* occurs across the Southern Andean Mountains, since Mendoza is located at the east of Andes, while Valparaíso is at the west side. Other species of *Pompilocalus*, such as *P. hirticeps* (Guérin-Méneville, 1838), also occur throughout east and west of Andes (Roig-Alsina 1989).

*Pompilocalus parvulus* has been recorded for center, north and east of Argentina, and southern Brazil (Figure 1), and its record in Anhembi expands the northern limits of this species' distribution. Specimens show no morphological variation from the description (Figure 3).

*Pompilocalus tupi* has been recorded only from Rio de Janeiro and Santa Catarina states, Brazil. We



**Figure 1.** Distribution map of *Pompilocalus guayamallen* Roig-Alsina, *P. parvulus* Roig-Alsina and *P. tupi* Roig-Alsina. The stars represent the new records, and the circles represent the ones given by Roig-Alsina.

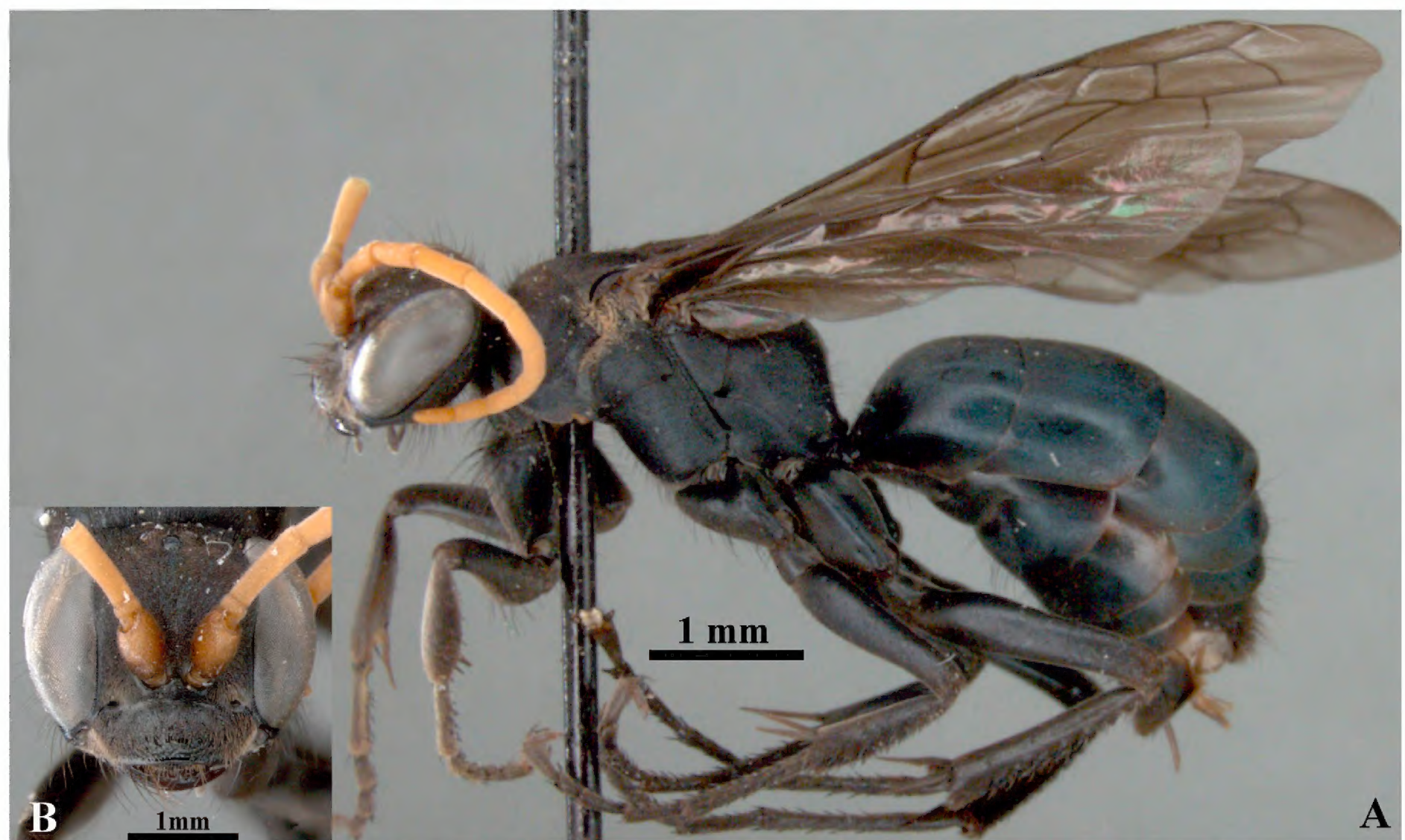
found a new record from Pelotas, Rio Grande do Sul state, Brazil (Figure 1), which delimits the southern distribution range of *P. tupi*. The specimen, a female (Figure 4), has slight morphological variation by presenting all flagellomeres and clypeus completely orange, while the specimens studied by Roig-Alsina (1989) have the last 1–3 flagellomeres dorsally blackened.

The distribution of *Pompilocalus* fits the Chilean Subregion, reaching the south and the southeast of the Brazilian Subregion (*sensu* Wallace 1876). Wallace (1876) proposed these subregions as part of the Neotropical Region, featuring the Chilean Subregion as the temperate portion of South America and delimiting it by the cold damp forests of Tierra del Fuego on the south, and by the Chaco in the northern Argentina on the north. It extends to Uruguay on the east and along the Páramo ecosystem as far as  $05^{\circ}$  S in the northwest (Wallace 1876). On the other hand, the Brazilian Subregion occupies the rest of South America, extending into Central America as far as the Isthmus of Panama (Wallace 1876). Regarding the most recent study on the South American zoogeographical regions, Morrone (2006) divided the Chilean Subregion into Andean Region, South American Transition Zone (SATZ), and part of the Neotropical Region. According to Morrone (2006), most of the Andean biota originally evolved in Patagonia and gradually spread northward





**Figure 2.** *Pompilocalus guayamallen* Roig-Alsina. **A:** lateral habitus; **B:** frontal view head.



**Figure 3.** *Pompilocalus parvulus* Roig-Alsina. **A:** lateral habitus; **B:** frontal view head.





**Figure 4.** *Pompilocalus tupi* Roig-Alsina. **A:** lateral habitus; **B:** frontal view head.

into the SATZ during the Tertiary and Pleistocene, as a result of the tropical forests in temperate and arid communities. In this way, *Pompilocalus* may have started its diversification in the Andean Region reaching the SATZ and the southern Neotropical Region. In addition, Roig-Alsina (1989) highlights that species of *Pompilocalus* commonly occur in semi-desertic, desertic and in highland ecosystems. Regarding the aspects discussed above, the occurrence of this genus in such ecosystems is more related to its evolutionary history than its ecological aspects because the predominant ecosystem in these regions is desert and semidesert (Fearnside 2001; Pallarés et al. 2005).

In conclusion, our findings expanded the distribution for three species of *Pompilocalus* as follows: *P. guayamallen* occurs in Mendoza, Argentina and Valparaíso, Chile; *P. parvulus* occurs in the Argentine provinces Buenos Aires, Jujuy, Catamarca, Córdoba, Misiones, San Luis, and Tucumán, and in São Paulo and Paraná states, Brazil; and *P. tupi* occurs in Rio de Janeiro, Rio Grande do Sul, and Santa Catarina states, Brazil.

## ACKNOWLEDGEMENTS

We are grateful to Dr. Gavin Broad, curator of the Natural History Museum of London (BMNH), and to National Counsel of Technological and Scientific Development of Brazil (CNPq) for the postdoctoral

fellowships provided to E. F. dos Santos (Proc.: 211689/2013-0) and for the PhD scholarships provided to E. N. L. Ferreira.

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**Authors' contribution statement:** Eduardo F. Dos Santos identified all species, photographed some species and wrote the text, Larissa Emanoela da Silva photographed *P. Parvulus*, made the distribution map and wrote the text. Elisângela Novais Lopes Ferreira collected material, and Fernando Barbosa Noll wrote the text.

**Received:** September 2014

**Accepted:** March 2015

**Editorial responsibility:** Benoit Guénard and Georg Fischer